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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

NGUYEN, TUAN N

ART UNIT	PAPER NUMBER
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2828

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07/05/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/783,143	Applicant(s) LUTGEN ET AL.	
	Examiner Tuan N. Nguyen	Art Unit 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04/23/2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. In respond to applicant's amendment filed 04/23/2007, claim 3 has been canceled. Claim 25 has been added.

Claim Rejections - 35 USC § 102

2. The following is a quotation of 35 U.S.C. 102(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 1-12, 15, 19-20, 23-24 are rejected under 35 U.S.C. 102(a) as being unpatentable over Paschotta (WO 01/59895)

With respect to claim 1 Paschotta (WO 01/59895) discloses a laser device for generating laser pulses (*Fig 1: 21, 1, 10 semiconductor device generating laser pulses 10, 10'; Fig 7: 2 with an optically pumped semiconductor laser (Fig 1, 7: 7) (Page 12: 5-15 diode pumping laser), comprising:*

a semiconductor laser having an active layer (*Fig 1: 3 Multi Quantum Well/ gain layer*)(*ABSTRACT: Band-gap engineering can be used ... even integrate gain ... within the same wafer*);

a first pump radiation source which is monolithically integrated into the semiconductor laser (*It is inherent and known in the art that semiconductor laser device gain/active/quantum well layer are driven via the electrodes integrate into the semiconductor cause semiconductor to lase*);

an external resonator (*Fig 7, 8: 12 external resonator*)(*Page 11: 10-24 first reflective and second reflective element 11, 12, "active mirror element"*),

and at least one mode-locker (*Fig 1, 7: 5*)(*Page 11: 15-20 SESAM semiconductor saturable absorber mirror*)(*Title: Passively mode-lock optically pumped semiconductor external-cavity laser*) (*Page 3: 10-20, passive mode locking technique relies on saturable absorber mechanism*),

wherein the active layer is optically pumped by the monolithically integrated first pump radiation source (*Page 11: 15-22*)(*Fig 1: 3 quantum well/active layer the first pump source monolithically integrated into the semiconductor laser*)(*ABSTRACT*).

With respect to claim 2, (*Fig 1, 7: 7*) shows wherein the semiconductor laser is optically pumped by means of a pump radiation source arranged *externally* (*Fig 1, 7: pump radiation source 70 into the semiconductor surface 21*).

With respect to claims 4, 5, 6 Paschotta (WO 01/59895) discloses and shows and at least one mode-locker that is passive mode-locker and is a saturable absorber (*Fig 1, 7: 5*)(*Page 11: 15-20 SESAM semiconductor saturable absorber mirror*)(*Title: Passively mode-lock optically pumped semiconductor external-cavity laser*) (*Page 3: 10-20, passive mode locking technique relies on saturable absorber mechanism*),

With respect to claim 7 Paschotta (WO 01/59895) discloses the mode-locker is monolithically integrated into the semiconductor laser (*Page 11: 19-22 the bragg reflector part of the semiconductor made of semiconductor and locking a desired wavelengths*) (*Page 5: 5-10*

passively mode-locked incorporated into the semiconductor structure; page 7: 5-10 – passive mode-locked based on ion-doped crystal ; Page 13).

With respect to claim 8, Paschotta (WO 01/59895) discloses the mode-locker (10) is combined with a resonator mirror (9) (Page 13: 22-26: SESAM 5 consists of Bragg mirrors) (Page 17: Table 1 “Resonant structure 5- Low/Hi index made of AlAs & AlGaAs).

With respect to claims 9, 10 Paschotta (WO 01/59895) discloses wherein the resonator has a device for phase compensation, and arranged downstream of the resonator (Page 3: 10-20- passive mode locking use to stabilize short pulse)(Page 9: 1-3 – where suitable spectral filter in laser cavity or placing saturable absorber at a place in the cavity, for phase of wavelength compensation).

With respect to claims 11, 12 Paschotta (WO 01/59895) discloses the use of the optical fiber in the phase compensation (*Page 12: 7-8 light deliver through optic fiber*), and the folding mirror (*Col 12: 18 the folding mirror 8*).

With respect to claim 15 Paschotta (WO 01/59895) discloses the laser pulses have a pulse duration which is less than 100 ps (*Page 12: 23 pulse of 26ps*)(*Page 14: 19 – 25.7ps*)

With respect to claims 19, 20 Paschotta (WO 01/59895) shows the mode-locker is arranged in said external resonator, or arranged internally and part is arranged externally of the

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semiconductor laser. (Fig 1: 5, 12, 8, 4)(Fig 7: 4,5,12) (Fig 8,9: 12,5, mode locker and resonator mirror, Bragg, and output lens/resonator).

With respect to claim 23 Paschotta (WO 01/59895) discloses a laser device for generating laser pulses (Fig 1: 21, 1, 10 semiconductor device generating laser pulses 10, 10'; Fig 7: 2) with an optically pumped semiconductor laser (Fig 1,7: 7) (Page 12: 5-15 diode pumping laser), comprising:

an external resonator (Fig 7, 8: 12 external resonator)(Page 11: 10-24 first reflective and second reflective element 11, 12, "active mirror element"),

and at least one mode-locker (Fig 1,7: 5)(Page 11: 15-20 SESAM semiconductor saturable absorber mirror)(Title: Passively mode-lock optically pumped semiconductor external-cavity laser) (Page 3: 10-20, passive mode locking technique relies on saturable absorber mechanism),

wherein the resonator has a phase compensation element, said phase compensation element compensating for group velocity dispersion(ABSTRACT)(Page 11: 15-22 phase compensation saturable absorber mirror SESAM 5 and/or Bragg reflector compensating for velocity dispersion).

With respect to claim 24 Paschotta (WO 01/59895) discloses the phase element compensation is integrated into the semiconductor laser (Page 11: 19-22 the bragg reflector part of the semiconductor made of semiconductor and locking a desired wavelengths) (Page 5: 5-10 passively mode -locked incorporated into the semiconductor structure; page 7: 5-10 - passive mode-locked based on ion-doped crystal ; Page 13).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or non-obviousness.
5. Claims 13, 14, 16, 18, 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paschotta (WO 01/59895).

With respect to claims 13,14 (Fig 1, 7) shows the resonator has a first resonator branch for generating laser pulses having a wavelength, and a second resonator branch for generating laser pulses having a second wavelength (*Fig 1: 1st wavelength input 70, 1st lasing pulse from semiconductor 10, 2nd wavelength after enter and exit SESAM absorber mirror 12, 5*), and the pulses are coupled to one another in a phase-locked manner (*Fig 7: 10, 12 mode-lock to output coupler mirror*).

With respect to claims 16-18, the claims further require that the laser is a laser oscillator, amplifier, or CPA amplifier. Paschotta did not discretely disclose the laser type, however it has been held to be within one skill in the art to select known part for its suitability for the intended use involves only routine skill in the art, in this case the type of laser use would have been obvious as this would not have changed the structure and operation of optical pump laser device with mode locker.

With respect to claims 21, 22, the claims further require that the laser pulse duration is less than 20ps and 1ps. Paschotta (WO 01/59895) discloses the laser pulses have a pulse duration around 19-25.7ps (*Page 12: 23 pulse of 26ps*)(*Page 14: 19 – 25.7ps*). It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum ranges involves only routine skill in the art.

6. Claim 25 rejected under 35 U.S.C. 103(a) as being unpatentable over Paschotta (WO 01/59895) in view of Chilla (US 2003/0012247).

With respect to claim 25, the claim further require wherein the monolithically integrated first pump radiation source is arranged laterally adjacent to the active layer. Paschotta (WO 01/59895) discloses the above and Chilla '247 further shows (*Fig 7: the first radiation source electrodes are arranged lateral to active layer*).

Response to Argument

7. Applicant's arguments filed on 04/23/2007 have been fully considered but they are not persuasive.

Page 8-9, Applicant pointed out claim 1 is not anticipated by Paschotta because claim 1 requires *“a first pump radiation source...”* and further stated *“Paschotta reference is activated by external pump source, not by a current. As a result, there is no need to use electrodes to inject current into the active layer... Secondly, even if Paschotta had electrodes, they could not qualify as first pump radiation source...”*; the Applicant continues to point out *“ Paschotta explicitly explained : the laser uses a semiconductor wafer in which a stack of quantum wells is grown adjacent to single Bragg mirror structure. Light from one or more multi-mode light-power diode lasers is focused onto the face of the wafer and pumps the wells by absorption in the barrier regions”*. The Examiner stands, the radiation emission is the result from a first electrical pump source, in this case, is the source that lased many semiconductor devices. If the Applicant's first pump radiation source is distinctly different from Paschotta then it is definitely not in the claim nor distinctly shown from drawing; furthermore, it is irrelevant if Paschotta has additional structure or having one or more multi-mode light pumping the element. *Chilla 2003/0012247 Fig 7 also shows and discloses a monolithic pump source and an external optical pump source.*

Page 10, Applicant continues *“Paschotta fails to teach or disclose the limitation that an active layer is optically pumped by a monolithically integrated first pump radiation source”*. The Examiner stands, the claim limitations still can be read by Paschotta. The claim does not distinct from the reference as how or what the monolithically integrated first pump radiation source is.

Conclusion

8. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP 706.07. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Communication Information

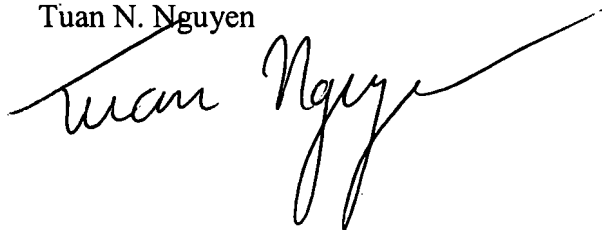
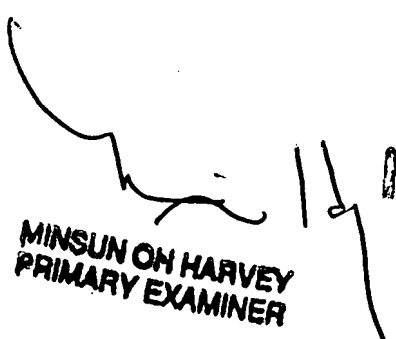
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan N Nguyen whose telephone number is (571) 272-1948. The examiner can normally be reached on M-F: 7:30 - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harvey Minsun can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tuan N. Nguyen

A handwritten signature in black ink, appearing to read 'Tuan Nguyen', with a long horizontal flourish extending to the right.A handwritten signature in black ink, appearing to read 'Minsun Oh Harvey', with a long horizontal flourish extending to the right.

**MINSUN OH HARVEY
PRIMARY EXAMINER**